2008 Fall Meeting
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Cite abstracts as **Author(s) (2008), Title, *Eos Trans. AGU, 89*(53), Fall Meet. Suppl., Abstract xxxxx-xx**

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HR: 0800h
AN: **V41B-2087**
TI: Variations of the Crustal Structure Along the Juan de Fuca Ridge From Analysis of Gravity and Seismic Data
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AB: Variations in axial topography and crustal structure are observed along the Juan de Fuca (JdF) Ridge which may reflect spatial variations in mantle melt supply and delivery to the crust along with temporal changes possibly linked to interaction with nearby off-axis melt anomalies and small hotspots. Here we analyze gravity and multi-channel seismic (MCS) data at the JdF Ridge in order to gain a better understanding of the possible sources for the crustal structure variation at the JdF Ridge. The data used in this paper were collected along the ridge axis as well as along three 300 km long transects perpendicular to the ridge at the Cleft, NSymm and Endeavour segments. For the model along the axis we assumed the density and thickness of the crust to be constant, 2.7 g/cm^3 and 6 km, respectively. Moho reflections identified in MCS data from profiles perpendicular to the ridge segments, and converted to depth using an assumed constant velocity indicate differences in crustal thickness for the three segments. This allows us to examine several different models for each of the transects; constant crustal thickness (6.5 km) and density (2.75 g/cm^3), seismically constrained variable thickness and constant density (2.75g/cm^3), and variable thickness and density distribution within the crust to provide the best fit model. The greatest differences in mantle Bouguer anomalies calculated for uniform density and thickness crust are for the Cleft and NSymm segments, with absolute value of ~4 mGal. Slightly lower differences are observed in the residual anomalies obtained for the models using uniform density and seismically inferred thickness crust with the maximum value of 2.5 mGal, observed between the same segments. This implies that the seismically inferred crustal thickness difference between these two segments (~500 m) accounts for ~37% of the observed anomaly. Thus the rest of the anomaly requires the presence of the melt and/or higher temperature within the crust and/or upper mantle. The best fit models require the presence of a wider region of lower density material under the Cleft and Endeavour segments in comparison with the NSymm. In addition to the above models a series of half plate thermal cooling models were run. Asymmetric residual anomalies are obtained for the axial region at Endeavour and NSymm segments with a negative anomaly extending 50 km from the axis to the west, while at the Cleft, residual anomalies remain low on both sides of the axis.
DE: 1219 Gravity anomalies and Earth structure (0920, 7205, 7240)
SC: Volcanology, Geochemistry, Petrology [V]
MN: 2008 Fall Meeting

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